

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 03, 2014

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)
Project Managers: Kyle Lawrence & Jacob Fenske

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 03, 2014 07:00 to December 04, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® personnel accompanied Patriot personnel tasked with opening manways of frac tanks that were used for storm water collection in Sector E1. Upon opening the manway hatch of frac tank #253155, an instantaneous concentration of 20 ppm H_2S was detected. Tank #253176 was also monitored. Both the CTEH® and the Patriot employee present were in full-face air-purifying respirators (APR) at the time of the detection, and egressed shortly thereafter. Subsequent H_2S readings around the tank and at the nearby "Decon B" area showed no concentrations of H_2S present. CTEH® continuously monitored the manway opening using AreaRAEs through the remainder of operations in Division E with no concentrations of H_2S detected. The results of the manually-logged H_2S monitoring at frac tanks are summarized in Table 1.1.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area and an additional two units by frac tanks near the designated decon areas. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . Field responders confirmed that LEL readings up to 3.4% were due to electronic sensor drift, and the LEL sensor was recalibrated. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

No particulate monitors were data-logged along the facility perimeter during this reporting period due to rain.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 03, 2014 07:00 – December 04, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl ₂	MR+ / MR Pro	20	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	20	0	NA	<1 %
	O ₂	MR+ / MR Pro	21	21	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	20	0	NA	<0.1 ppm
	PM ₁₀	AM510/DustTrak	17	17	0.006	0.002 - 0.01 mg/m ³
	SO ₂	MR+	20	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	20	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	20	0	NA	<0.1 ppm
Exclusion Zone	Cl ₂	Gastec 8La	1	0	NA	<0.05 ppm
	H ₂ S	Gastec 4LL	1	0	NA	<0.1 ppm
		MR+ / MR Pro	10	0	NA	<1 ppm
	LEL	MR+ / MR Pro	10	0	NA	<1 %
	O ₂	MR+ / MR Pro	9	9	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	1	0	NA	<0.1 ppm
	SO ₂	MR+ / MR Pro	10	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	1	0	NA	<0.2 mg/m ³
Work Area	VOC	MR+ / MR Pro	13	0	NA	<0.1 ppm
	Cl ₂	MR+ / MR Pro	11	0	NA	<0.1 ppm
	H ₂ S	MR+ / MR Pro	18	0	7.666	1 - 20 ppm
	LEL	MR+ / MR Pro	10	0	NA	<1 %
	O ₂	MR+ / MR Pro	4	4	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	3	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	1	1	0.001	0.001 - 0.001 mg/m ³
	SO ₂	MR+ / MR Pro	22	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	1	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	22	0	NA	< 0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 1.1: Manually-Logged Real-Time Air Monitoring Summary – Frac Tank Assessment¹
December 03, 2014 09:52 – December 04, 2014 10:03

Location	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Tank #253155	H ₂ S	MR+	2	2	10.5	1 - 20 ppm
Tank #253176	H ₂ S	MR+	1	1	2	2 - 2 ppm

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Table 2: AreaRAE Air Monitoring Summary¹
December 02, 2014, 2014 07:00 – December 03, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H ₂ S	5541	11	0.1 ppm	0.1 - 0.2 ppm
	LEL	5541	0	NA	< 1 %
	SO ₂	5541	9	0.1 ppm	0.1 - 0.1 ppm
	VOC	5541	50	0.1 ppm	0.1 - 0.2 ppm
Unit 02	H ₂ S	5497	7	0.1 ppm	0.1 - 0.3 ppm
	LEL	5497	64	2.1%	1.2 - 3.4 %
	SO ₂	5497	0	NA	< 0.1 ppm
	VOC	5497	13	0.1 ppm	0.1 - 0.1 ppm
Unit 03	H ₂ S	5571	191	0.1 ppm	0.1 - 0.2 ppm
	LEL	5571	0	NA	< 1 %
	SO ₂	5571	0	NA	< 0.1 ppm
	VOC	5571	0	NA	< 0.1 ppm
Unit 04	H ₂ S	5505	0	NA	< 1 ppm
	LEL	5505	0	NA	< 1 %
	SO ₂	5505	0	NA	< 0.1 ppm
	VOC	5505	0	NA	< 0.1 ppm
Unit 05	H ₂ S	1251	5	0.1 ppm	0.1 - 0.1 ppm
	LEL	1251	0	NA	< 1 %
	SO ₂	1251	0	NA	< 0.1 ppm
	VOC	1251	0	NA	< 0.1 ppm
Unit 06	H ₂ S	1187	258	0.2 ppm	0.1 - 0.7 ppm
	LEL	1187	0	NA	< 1 %
	SO ₂	1187	0	NA	< 0.1 ppm
	VOC	1187	13	0.4 ppm	0.1 - 1.8 ppm
Unit 07	H ₂ S	1183	0	NA	< 1 ppm
	LEL	1183	0	NA	< 1 %
	SO ₂	1183	14	0.1 ppm	0.1 - 0.1 ppm
	VOC	1183	788	0.3 ppm	0.1 - 1.5 ppm

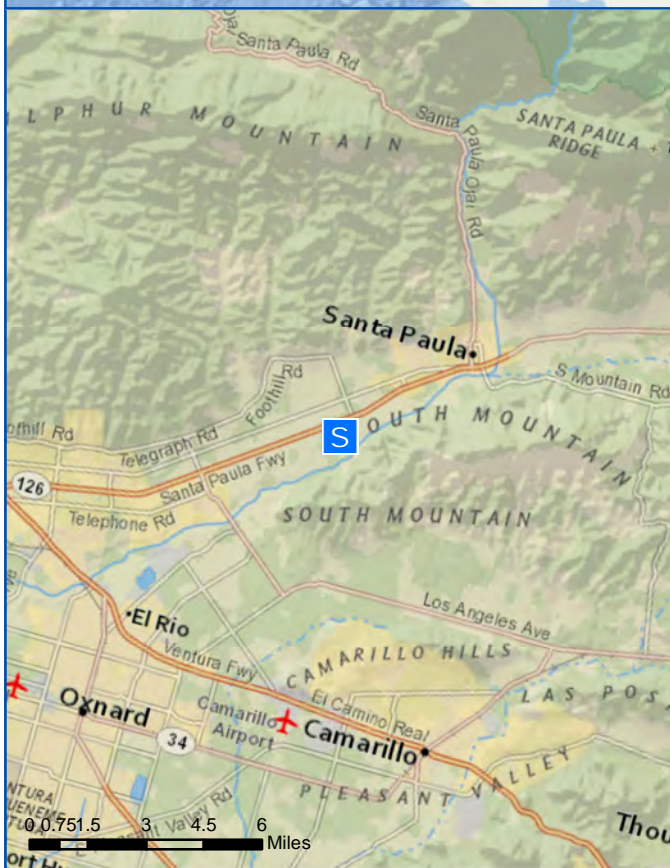
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²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Appendix A

Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend
 Site Location

0 50 100
Feet





Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

0 250 500 1,000
Feet



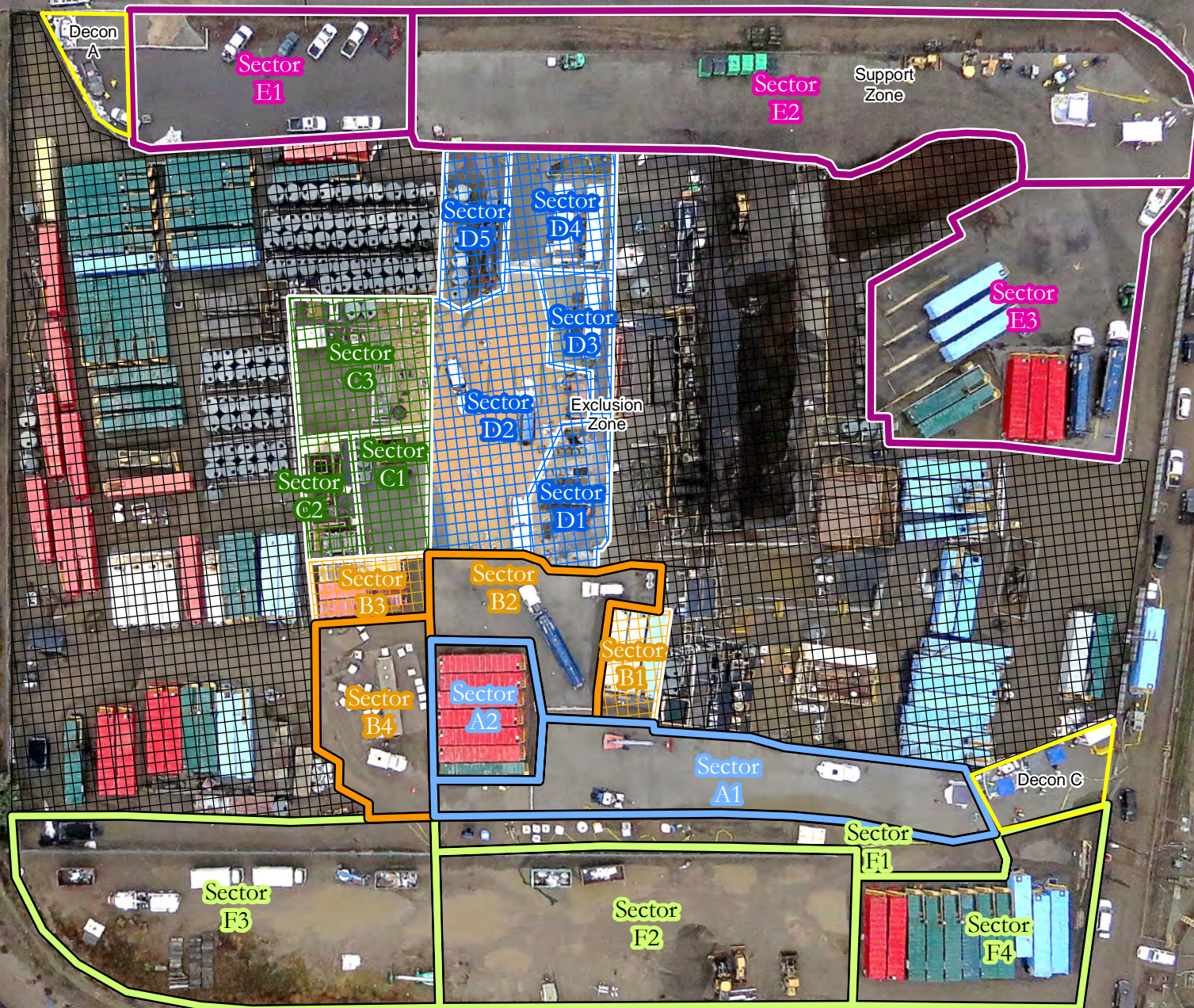
Legend

- FRT Location
- Site Location

0 50 100
Feet



0 50 100 Feet









Legend

Monitoring Location

-  Non-detect (< 0.2 mg/m³)
-  Incident Site



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles



Legend

Monitoring Location

- Detect (0.001 - 0.01 mg/m³)
- S Incident Site





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site





Appendix B:

AreaRAE Trend Graphs, AM510
Trend Graphs, and
AreaRAE/AM510 Air Monitoring
Location Map

0 50 100
Feet



Legend

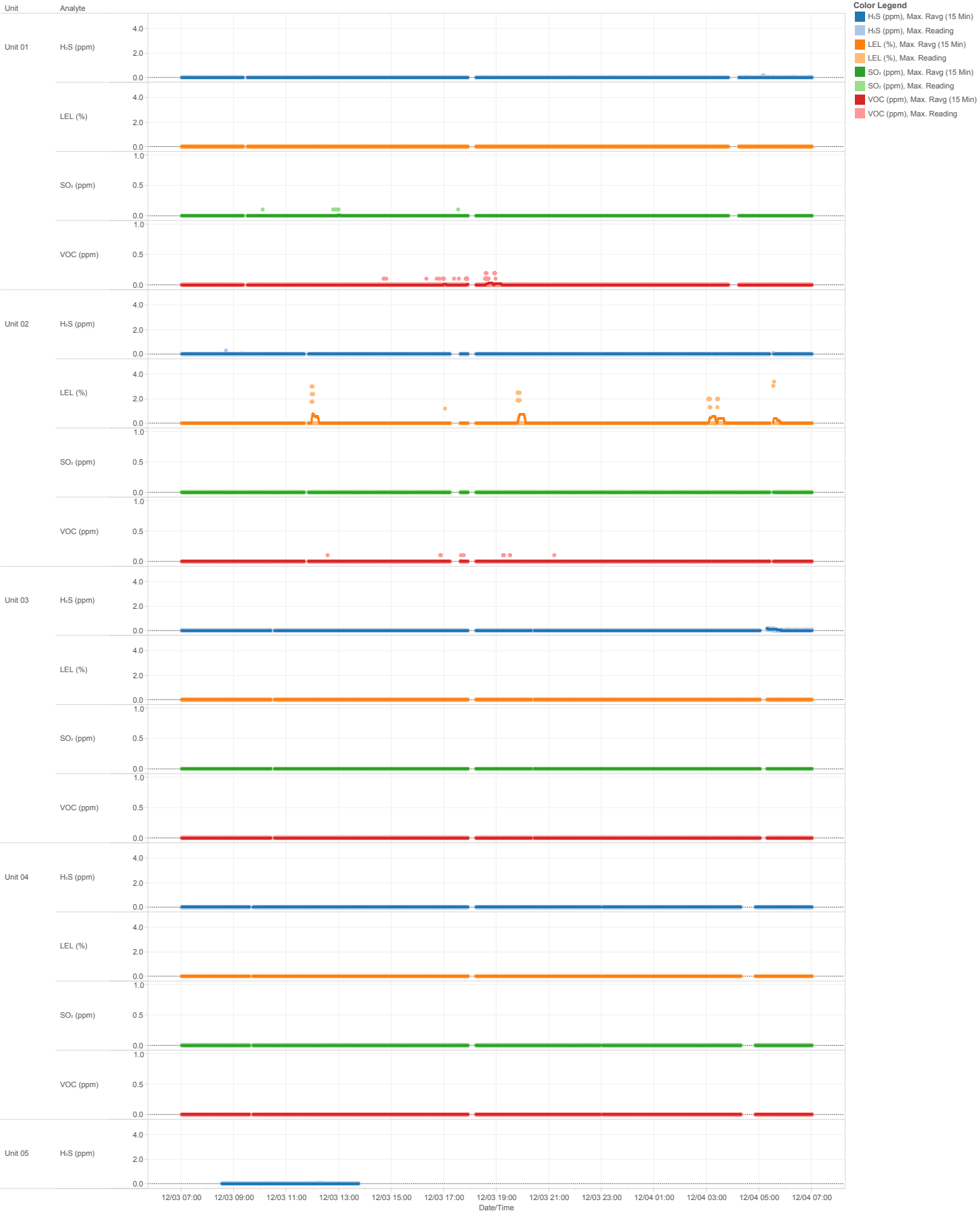


AreaRAE & AM510 station



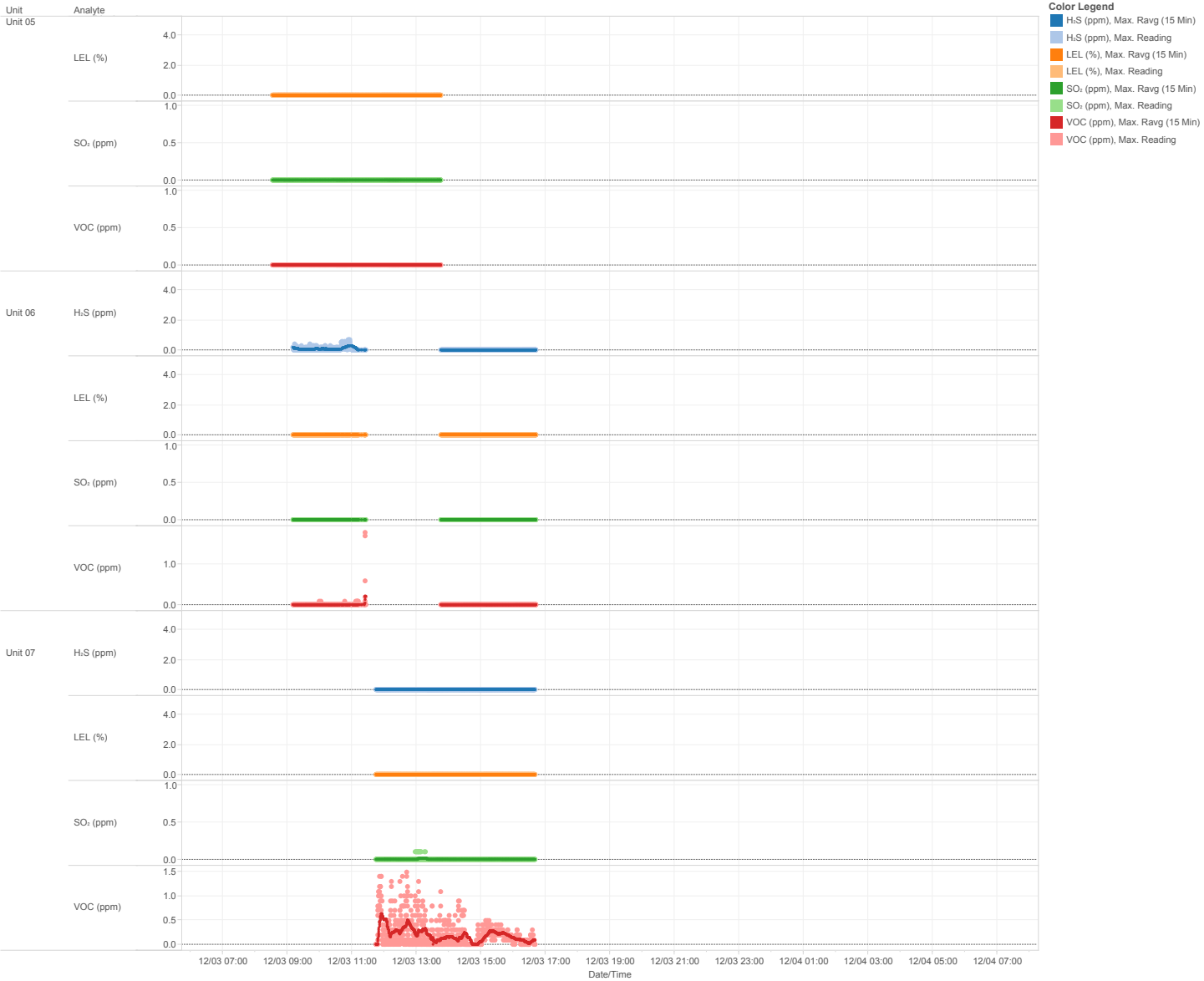
AreaRAE Station

Patriot Environmental
AreaRAE Trend Graphs
12/03/2014 07:00 - 12/04/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/03/2014 07:00 - 12/04/2014 07:00



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